

Claims

We claim:

1. An elastomeric article comprising an elastomeric layer and a surface modification layer wherein the elastomeric article is selected from the group consisting of a glove, a condom, a stent, a catheter balloon, and a probe cover, and wherein the elastomeric layer comprises a polymer selected from the group consisting of natural rubber latex, synthetic polyisoprene, nitrile, and blends thereof, and wherein the surface modification layer comprises a mixture of silicone and ammonium salts of alkyl phosphates.
2. An elastomeric article according to claim 1, wherein the silicone comprises polydimethylsiloxane.
3. An elastomeric article according to claim 2, wherein the surface modification layer further comprises cetyl pyridinium chloride.
4. A glove comprising an elastomeric layer and an outer surface layer wherein the elastomeric layer comprises a polymer selected from the group consisting of natural rubber latex, synthetic polyisoprene, nitrile, and blends thereof, and wherein the outer surface layer comprises a mixture of silicone and ammonium salts of alkyl phosphates.
5. A glove according to claim 4, wherein the glove is powder free.
6. A glove according to claim 5, wherein the elastomeric layer is a natural rubber latex.

7. A glove according to claim 5, wherein the elastomeric layer is polyisoprene.
8. A glove according to claim 5, wherein the elastomeric layer is nitrile.
9. A glove according to claim 5, wherein the elastomeric layer is a blend of two or more polymers selected from the group consisting of natural rubber latex, synthetic polyisoprene, and nitrile.
10. A glove according to claim 4, wherein the silicone comprises polydimethylsiloxane.
11. A glove according to claim 4, wherein the outer surface layer further comprises cetyl pyridinium chloride.
12. A glove according to claim 4, wherein the glove has a reduced coefficient of friction compared to the same glove without said outer surface layer treatment.
13. A glove according to claim 4, wherein the glove has a coefficient of friction less than about 0.4.
14. A glove according to claim 4, wherein the glove has reduced stickiness when compared to the same glove without said outer surface layer treatment.

15. A glove according to claim 4, wherein the glove has improved double-donnability as measured by the coefficient of friction when compared to the same glove without said outer surface layer treatment.

16. A powder-free elastomeric glove having an internal surface comprising a first elastomeric layer, a second intermediate layer of a rubber blend comprised of a synthetic rubber and nitrile rubber disposed on said first layer and a third nitrile rubber coating layer disposed on said intermediate layer, and wherein the glove has an outer surface layer comprising a mixture of silicone and ammonium salts of alkyl phosphates.

17. The glove of claim 16 wherein the elastomeric layer is a natural rubber layer.

18. The glove of claim 16 wherein the elastomeric layer is a nitrile layer.

19. The glove of claim 16 wherein the elastomeric layer is a synthetic polyisoprene layer.

20. The glove of claim 16 wherein the elastomeric layer is comprised of the synthetic rubber used in the intermediate layer.

21. The glove of claim 16 wherein the nitrile rubber is comprised of a carboxylated acrylonitrile butadiene rubber having an acrylonitrile content of about 25 to about 40 parts, a butadiene content of about 55 to about 68 parts and a carboxylic acid content

of about 3 to about 6 parts.

22. A glove according to claim 16, wherein the outer surface layer further comprises cetyl pyridinium chloride.

23. A glove comprising a polyisoprene layer and having a tensile strength of greater than 3000 psi as measured in accordance with ASTM D412, said glove being prepared from a polyisoprene latex composition comprising a dithiocarbamate compound, a thiazole compound, and a guanidine compound, wherein the glove is substantially free of powder, and further wherein the glove has an outer surface layer comprising a mixture of silicone and ammonium salts of alkyl phosphates.

24. A glove according to claim 23, wherein the silicone comprises polydimethylsiloxane.

25. A glove according to claim 23, wherein the outer surface layer further comprises cetyl pyridinium chloride.

26. A method of improving the outer surface properties of gloves that have been chlorinated comprising the steps of chlorinating the surface of gloves followed by treating the surfaces of said chlorinated gloves with an aqueous mixture of silicone emulsion and ammonium salts of alkyl phosphates wherein the gloves contain an elastomeric layer selected from the group consisting of natural rubber latex, synthetic polyisoprene, nitrile, and blends thereof.

27. A method according to claim 26, wherein the improved outer-surface properties are decreased variation in outer-surface tack between different gloves and decreased variation in outer-surface tack along the outer surface of a single glove as compared to untreated gloves.

28. A method according to claim 26, wherein the elastomeric layer is natural rubber.

29. A method according to claim 26, wherein the elastomeric layer is synthetic polyisoprene.

30. A method according to claim 26, wherein the silicone emulsion comprises polydimethylsiloxane.

31. A method according to claim 26, wherein the outer surfaces of the gloves are further treated with cetyl pyridinium chloride.

32. A method of obtaining an elastomeric article according to claim 1, comprising the steps of forming an elastomeric article, treating the surfaces of the article with chlorine, and further treating the surfaces of the article with a surface modification treatment comprising an aqueous mixture of silicone emulsion and ammonium salts of alkyl phosphates.

33. A method according to claim 32, wherein the silicone emulsion comprises polydimethylsiloxane.

34. A method according to claim 32, wherein the surface modification treatment further comprises cetyl pyridinium chloride.

35. A process for making a powder-free elastomeric glove having an internal surface comprising a first elastomeric layer, a second intermediate layer of a rubber blend comprised of a synthetic rubber and nitrile rubber disposed on said first layer and a third nitrile rubber coating disposed on said intermediate layer, and wherein the glove has an outer-surface modification treatment comprising a mixture of silicone and ammonium salts of alkyl phosphates, comprising the steps of:

- (a) dipping a former into a coagulant dispersion to deposit a coagulant layer on the former;
- (b) dipping the former with the deposited coagulant layer into an elastomer to produce a second layer comprising coagulated elastomeric layer thereon;
- (c) dipping the second layer of coagulated elastomer into a blend of a synthetic rubber and a nitrile rubber dispersion to form an intermediate layer on the glove;
- (d) dipping the intermediate layer of a synthetic rubber and a nitrile rubber into a powder-free dispersion comprised of a nitrile rubber dispersion and a silicone emulsion;
- (e) curing the layers and the coating on the former;
- (f) stripping the glove from the former;
- (g) turning the glove so that the coated side of the article is on the exterior of the glove;

- (h) treating the glove to remove powder;
- (i) treating the surfaces of the glove with a solution comprising an aqueous mixture of silicone emulsion and ammonium salts of alkyl phosphates;
- (j) drying the glove;
- (k) turning the glove so that the coated side of the glove is on the interior of the glove;
- and
- (l) drying the glove.

36. The process of claim 35 wherein the step of treating the glove to remove powder comprises the step of immersing the glove into an aqueous chlorinating solution followed by the step of rinsing the glove.

37. The process of claim 35, wherein the solution of step (i) further comprises cetyl pyridinium chloride.

38. The process of claim 36 comprising the additional step of leaching the glove in water after the former is dipped into the synthetic rubber and nitrile rubber dispersion to produce the intermediate layer.

39. A process for making a powder-free elastomeric glove having an internal surface comprising a first elastomeric layer, a second intermediate layer of a rubber blend comprised of a synthetic rubber and nitrile rubber disposed on said first layer and a third nitrile rubber coating disposed on said intermediate layer, and wherein the glove

has an outer-surface modification treatment comprising a mixture of silicone and ammonium salts of alkyl phosphates, comprising the steps of:

- (a) dipping a former into a coagulant dispersion to deposit a coagulant layer on the former;
- (b) dipping the former with the deposited coagulant layer into an elastomer to produce a second layer comprising coagulated elastomeric layer thereon;
- (c) dipping the second layer of coagulated elastomer into a blend of a synthetic rubber and a nitrile rubber dispersion to form an intermediate layer on the glove;
- (d) dipping the intermediate layer of a synthetic rubber and a nitrile rubber into a powder-free dispersion comprised of a nitrile rubber dispersion and a silicone emulsion;
- (e) curing the layers and the coating on the former;
- (f) stripping the glove from the former;
- (g) turning the glove so that the coated side of the article is on the exterior of the glove;
- (h) treating the glove to remove powder;
- (i) drying the glove;
- (j) turning the glove so that the coated side of the glove is on the interior of the glove;
- (k) treating the surfaces of the glove with a solution comprising an aqueous mixture of silicone emulsion and ammonium salts of alkyl phosphates; and
- (l) drying the glove.

40. The process of claim 39 wherein the step of treating the glove to remove powder comprises the step of immersing the glove into an aqueous chlorinating solution followed by the step of rinsing the glove.

41. The process of claim 39 comprising the additional step of leaching the glove in water after the former is dipped into the synthetic rubber and nitrile rubber dispersion to produce the intermediate layer.